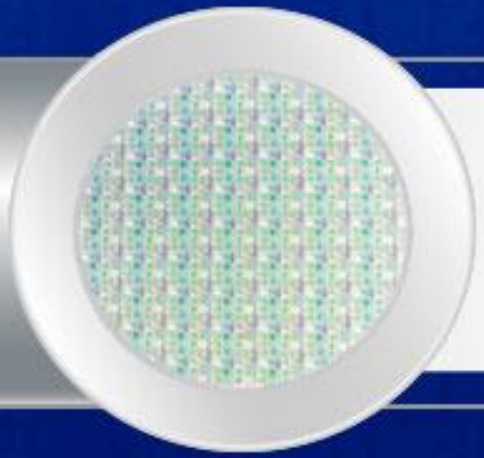
TOWERJAZZ

The Global Specialty Foundry Leader



# Strategy/ Performance: Continuous Growth

Dr. Itzhak Edrei, President

June 2017

# The Global Specialty Analog Foundry

**Fabless**

SKYWORKS

BROADCOM

SEMTECH

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## Specialty Analog IC Manufacturing

Proprietary Process Technology

Analog-Accurate Design Kits

Global specialty manufacturing capacity

**Enabling fast time to market and high volume assurance of supply**

**IDM**

ON Semiconductor

intel

infineon

## WE NEVER COMPETE WITH OUR CUSTOMERS

# TowerJazz: The Global Specialty Foundry Leader | A SNAPSHOT

## Proven Analog Business Model

**Fastest Growing Foundry** in the **world** with **Proportional Growth** in **All Financial Metrics**

## Technology Leadership

**Wide Range** of **Advanced** and **Differentiated Specialty Analog Offerings**

## Market Leadership

**Well Positioned** in the **Fastest Growing Markets** with **Long Term Customer Relationships** and **Roadmap Alignment**

## Operational Excellence

**High Worldwide Manufacturing Capabilities** and **Flexibility**

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# Q1 2017 Financial Results

| | | |
|---|---|---|
| **Revenue** | **$330M** | **19% YoY growth** |
| **Gross Profit** | **$85M** | **38% YoY increase** |
| **Operating Profit** | **$53M** | **71% YoY increase** |
| **EBITDA** | **$101M** | **30% YoY increase** |
| **Net Profit** | **$46M** | **83% YoY increase** (excluding SA acquisition gain) |
| **Free Cash Flow** | **$42M** | **110% YoY increase** |
| **Q2 Revenue Guidance** | **$345** | Mid range +/- 4%<br>**Up 13% year over year** |

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# Foundry Landscape

| ($M) | 2005 | | 2010 | | 2015 | | 2016 | | 2016/15 Change | Accumulated Change |
|---|---|---|---|---|---|---|---|---|---|---|
| A | TSMC | 8,217 | TSMC | 13,307 | TSMC | 26,439 | TSMC | 29,488 | 11% | 259% |
| B | UMC | 3,259 | UMC | 3,965 | GF | 4,990 | GF | 5,545 | 10% | 390% |
| C | SMIC | 1,171 | GF | 3,510 | UMC | 4,464 | UMC | 4,582 | 3% | 41% |
| D | PowerChip | 1,587 | PowerChip | 2,424 | SMIC | 2,222 | SMIC | 2,921 | 31% | 150% |
| E | Chartered | 1,132 | SMIC | 1,555 | PowerChip | 1,268 | PowerChip | 1,275 | 1% | -20% |
| 1 | Vanguard | 353 | **TowerJazz** | **509** | **TowerJazz** | **961** | **TowerJazz** | **1,249** | **30%** | **1125%** |
| 2 | Dongbu | 347 | Vanguard | 505 | Vanguard | 736 | Vanguard | 800 | 9% | 127% |
| 3 | HHNEC | 313 | Dongbu | 495 | Hua Hong | 650 | Hua Hong | 712 | 10% | 127% |
| 4 | SSMC | 280 | SSMC | 330 | Dongbu | 585 | Dongbu | 672 | 13% | 94% |
| 5 | He Jian | 250 | X-Fab | 320 | SSMC | 460 | X-Fab | 510 | 54% | 146% |
| | | | | | | | | | | |
| 11 | **Tower** | **102** | | | | | | | | |

Digital Deep Sub Micron

Specialty Analog

The fastest growing foundry in the world

*Source: IC Insights, EE Times, Company Reports*



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# Analog vs. Digital: Main Differences

| | *Digital Foundries* | *Specialty Analog Foundries* |
|---|---|---|
| **Capacity CapEx** | **High** | **Low** |
| **Technology CapEx** | **High** | **Low** |
| **Product Lifetime** | **Short** | **Long** |
| **Customer Engagement** | **Typically multi-source** | **Sole or limited source** |
| **Technology Differentiation** | **At leading edge only** | **Across process technologies** |
| **Process Technologies** | **CMOS** | **CIS, SiGe, BCD, BiCMOS, MEMS** |
| **Technology Nodes** | **65nm-16nm<br>10nm prototyping** | **350nm-65nm – SPECIALTY** |
| | **High speed data crunching and heavy storage** | **Real world interfacing to digital world** |

# Market **MEGA**TRENDS driven by Internet of Things

## Key megatrends driving rapid growth in Analog/Mixed-Signal applications

**GREEN** EVERYTHING
Energy Efficiency

28% of Revenues

**WIRELESS** EVERYTHING
Seamless Connectivity

30% of Revenues

**SMART** EVERYTHING
Embedded Systems

18% of Revenues

Analog/Mixed-Signal Applications

| Power Management | High-Performance Analog | RF | Sensors (Imaging, MEMS) |
|---|---|---|---|

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# Advanced Specialty Analog Technology Platforms with Broad Technology Portfolio

RF
& HPA

Power/
MS CMOS

CIS

TOPS

# End Market Diversification – Top Customers

| | Power | Radio Frequency / High Performance Analog | | CMOS Image Sensors | Other (A&D, Mixed-Signal, Sensors, Embedded Memory, ESD etc.) |
|---|---|---|---|---|---|
| | ~28% | ~22% mobile | ~8% Infrastructure | ~18% | ~25% |
| Customer 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Customer 2 | | ✓ | ✓ | | |
| Customer 3 | ✓ | | ✓ | | ✓ |
| Customer 4 | ✓ | | | | |
| Customer 5 | | ✓ | ✓ | | ✓ |
| Customer 6 | | ✓ | ✓ | | |
| Customer 7 | ✓ | | | ✓ | ✓ |
| Customer 8 | ✓ | | ✓ | | ✓ |
| Customer 9 | | | | | ✓ |
| Customer 10 | ✓ | | | | |
| Customer 11-15 | ✓ | | ✓ | ✓ | ✓ |

# Global Footprint: Worldwide Manufacturing Capabilities

## High Quality, Flexibility and Capacity Assurance

Seven worldwide manufacturing facilities providing capacity assurance, operational flexibility, and dual-sourcing capabilities with available capacity of over 2.3 million wafers per year.

Migdal HaEmek, Israel

6" (150mm)
CMOS, CIS, Power, Power Discrete
1µm to 0.35µm
Planarized BEOL,
W and Oxide CMP

Midgal HaEmek, Israel

8" (200mm)
CMOS, CIS, Power, Power Discrete, MEMS, RFCMOS
0.18µm to 0.13µm
Cu and Al BEOL
EPI, 193nm Scanner

Newport Beach, USA

8" (200mm)
CMOS, CIS, MEMS, RF Analog
0.18µm to 0.13µm
Al BEOL, SiGe , EPI

San Antonio, USA

8" (200mm)
Power, RF Analog
• 0.18µm
Al BEOL

Tonami, Japan

8" (200mm)
Power Discrete, HVCMOS, CMOS, PMIC, NVM, CCD
0.5µm to 0.13µm

Uozu, Japan

12" (300mm)
CMOS, CIS, RF/CMOS
65nm to 45nm

Arai, Japan

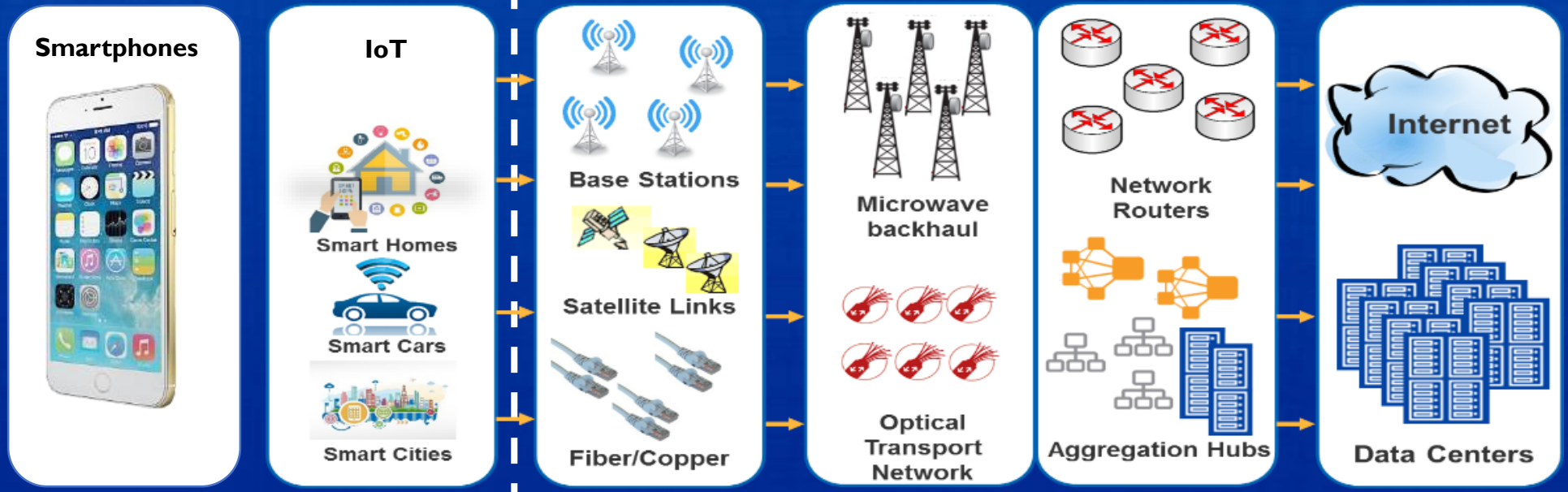
8" (200mm)
Analog, CIS, RFCMOS
0.13µm to 0.11µm
Thick Cu RDL

# Growth Drivers

# End-to-End View of Our RF Applications Markets

## *Mobile*

## *Infrastructure*




Connections at <100 Mbps
Built in **RF SOI, SiGe**

Connections Up to 100 Gbps
Built in **High Speed SiGe**

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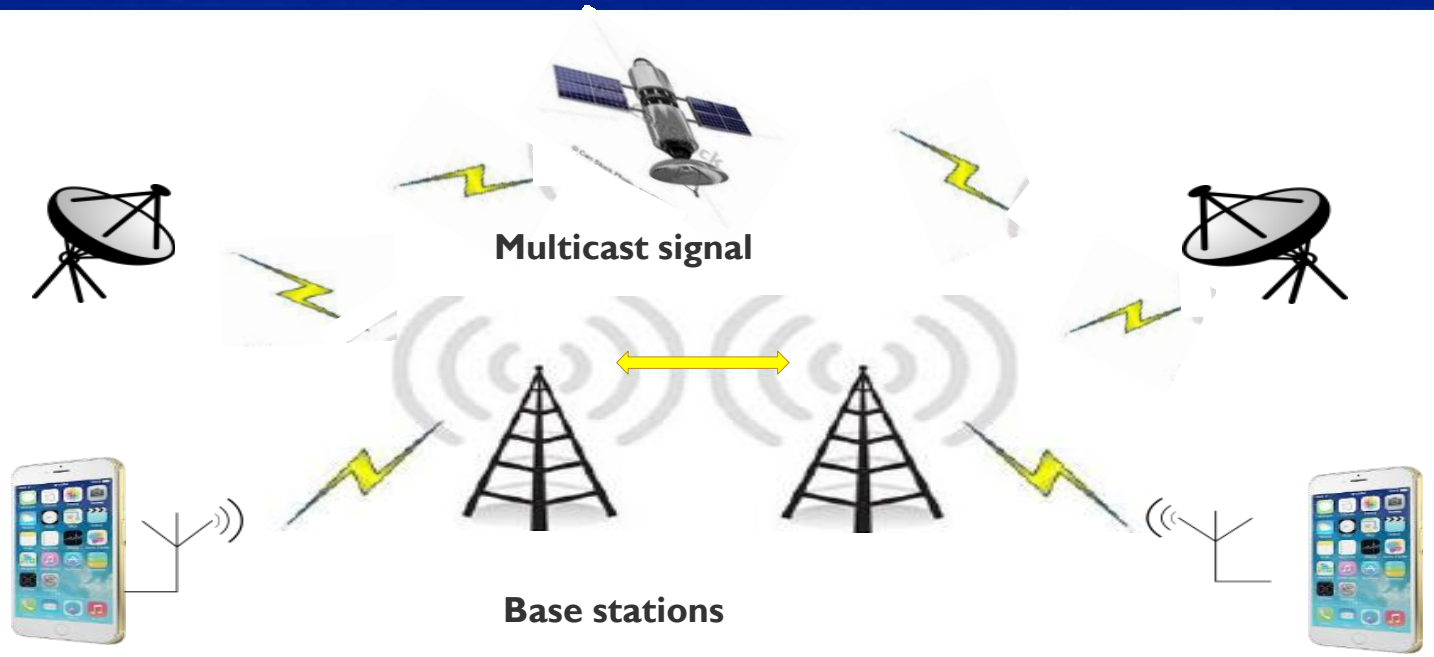
# Our world is analog… TowerJazz connects it to the digital!




**SiGe optical transceivers and mmWave backhaul**

**Transferring a picture between two mobile phones**
**An example of the critical roles of analog chips**

# CIS market segments and trends

| Automotive | Industrial / Machine Vision | Medical | High end photography and Cinematography | 3D, Gesture control, AR/VR | Security |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| ADAS and Autonomous driving | IoT and food automation | Technology shift | Market share increase | Disruptive new market | IoT |

# Power Management Growing Markets

Power Management ICs are needed in every electronic system to efficiently deliver the required voltages and currents while reducing the drain on the power grid and maximizing battery life


Leading the Foundry Arena with High-Performance Power Management Platforms

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# Analog Automotive Semiconductor Segment - Outlook

- With a robust CAGR of 10%, Analog Automotive Semiconductor segment continues to provide a growing end market for TowerJazz's Specialty Analog Foundry technologies

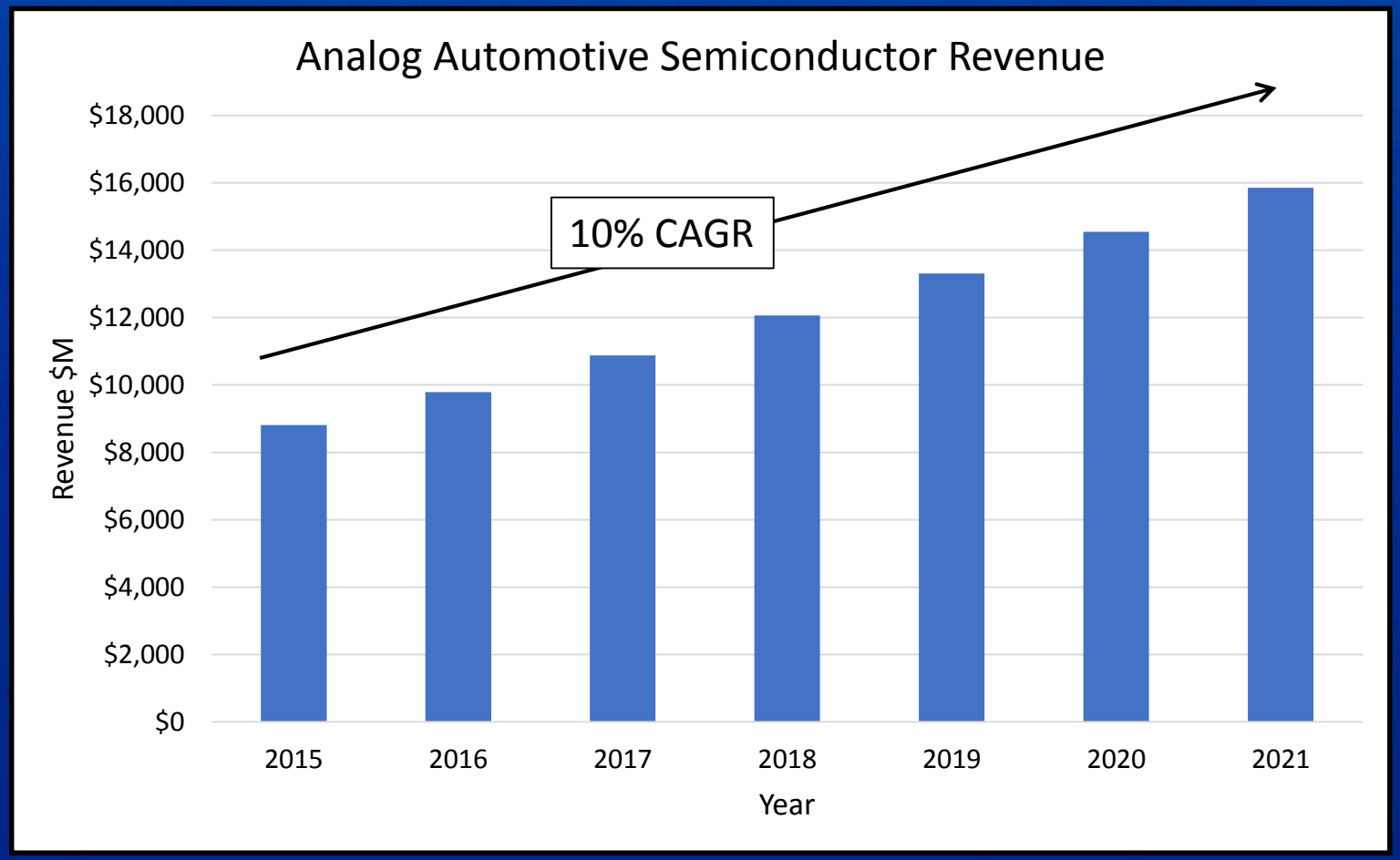
Battery Management

Vehicles
(Electrical/ Autonomous)

Radar
(Collision avoidance)

Wireless Connectivity

ADAS
(Advanced Driver Assistance Systems)



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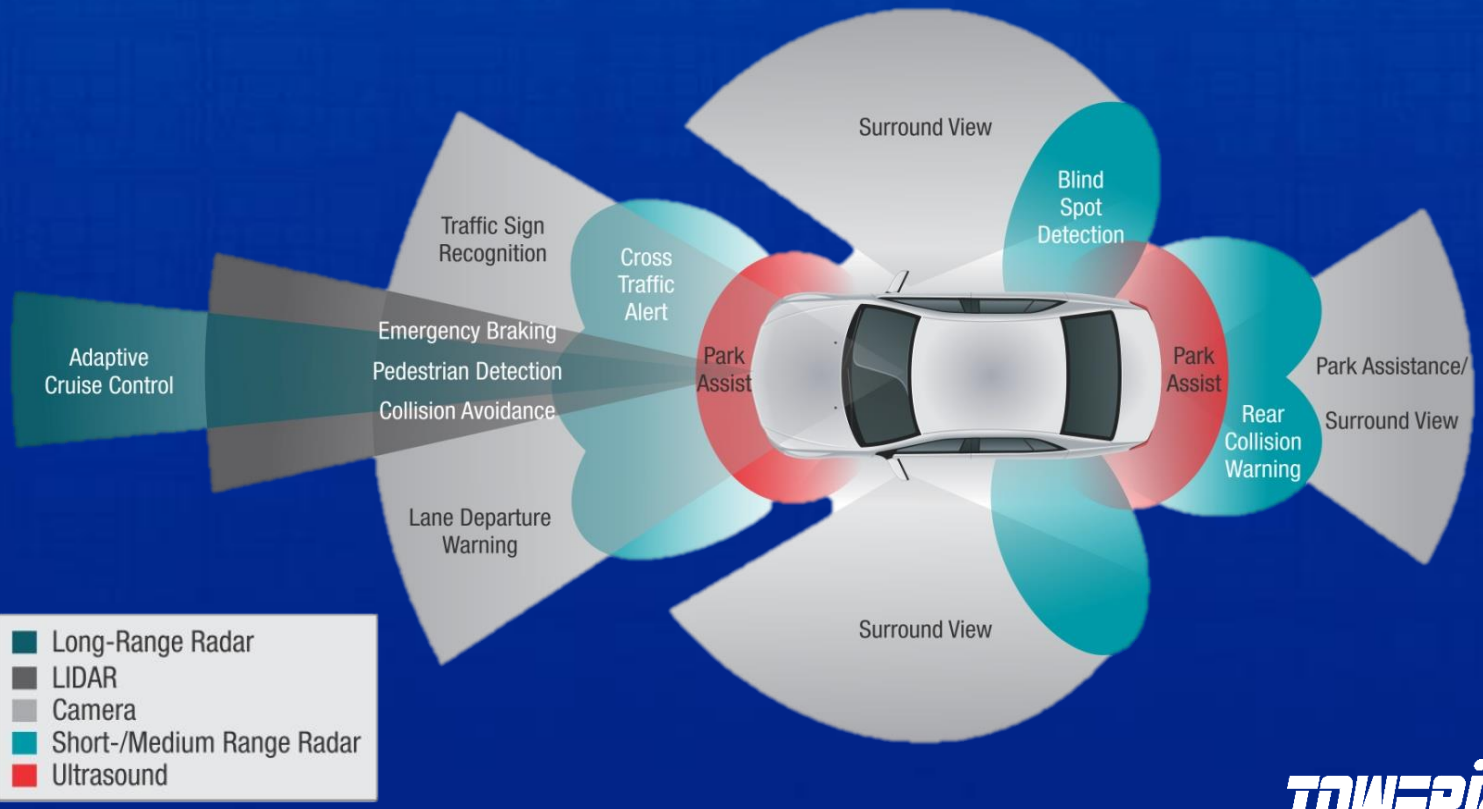
# Fast growing markets – Automotive

## Advanced Driver Assistance Systems (ADAS) and Autonomous Driving

- 360° coverage
- 6-8 cameras per car
- VGA moving to HD
- High Dynamic Range (HDR)
- Near IR vision
- LIDAR

"The global autonomous car market is expected to witness a CAGR of over 10% through 2035"
(Markets and Markets)



# Supporting Continued Growth

# M&A Strategy

1. **Increase Served Market**
   - Acquire new technologies w/ established customer base
   - Acquire new technologies which serves existing base

1. **Increase Operational Capacity**
   - Acquiring capacity at substantial lower cost than organic growth

1. **Create Geographic Alignment**
   - Improved customer alignment through local manufacturing (e.g. JDP execution)
   - Operational optimization and reduced customer risk through flow cross qualification

# M&A Examples: Adding Advanced Analog Capacity at Minimal Cost and Minimal Risk

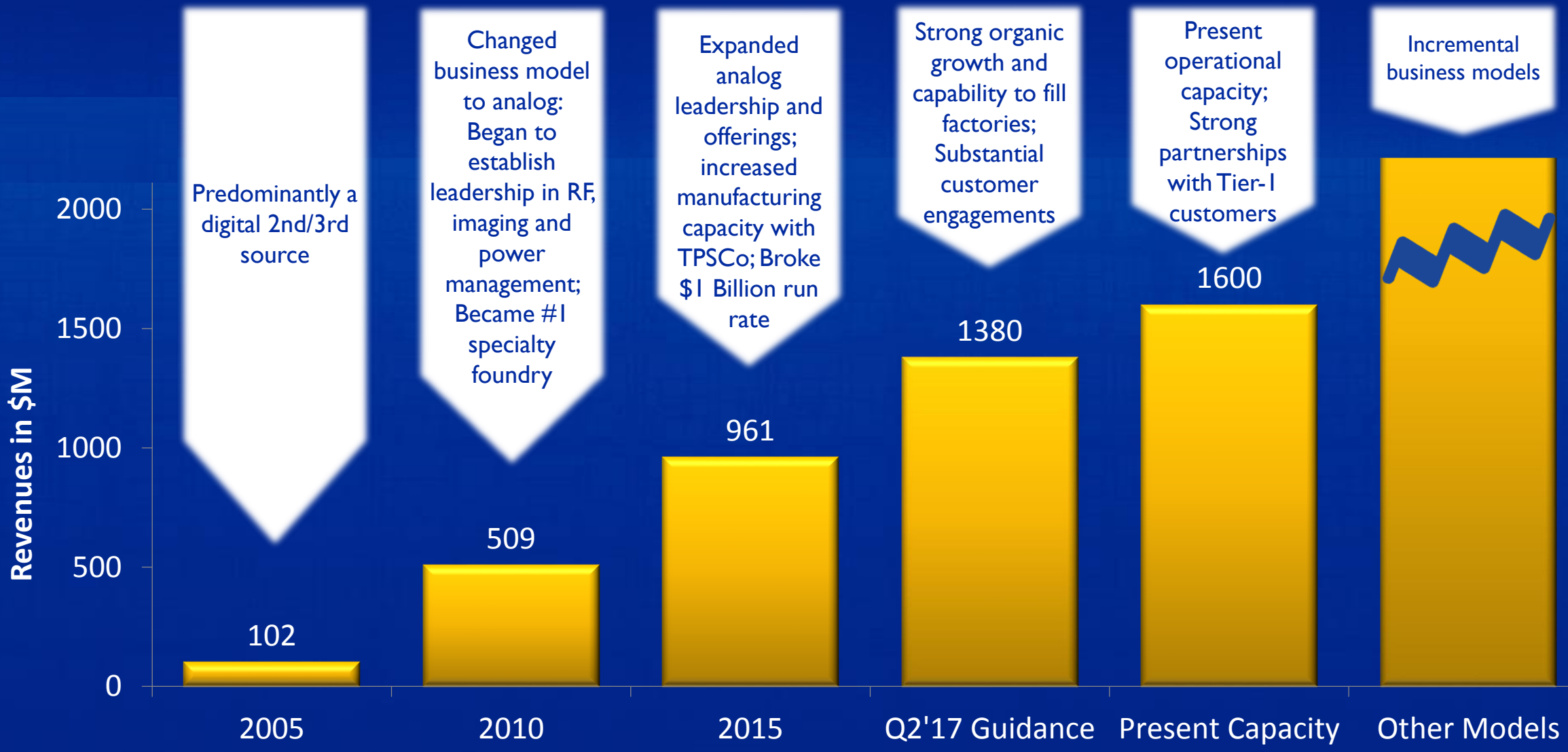
- Acquire existing factories from system or device maker companies with
  - Long term loading agreements to cover first multiple years running costs
  - Available capacity for incremental business from day one
  - Employee base and expertise within our defined strategic core analog capabilities

| TowerJazz Announces Completion and Kick-off of its Joint Venture with Panasonic Corporation | TowerJazz Completes Acquisition of Maxim's Fabrication Facility in San Antonio, Texas |
|---|---|
| Joint Venture to include three Semiconductor Factories in Japan, Manufacturing of Panasonic and Additional Products | Acquisition to expand TowerJazz's worldwide manufacturing capacity and capabilities; Supporting Company's excess customer demand |
| **April 1, 2014** | **February 2, 2016** |

# Industry Consolidations

- To date, the major consolidations have opened up greater opportunities for us because we were a trusted supplier of either the acquiring or the acquired company or both
- Examples of consolidations with TowerJazz press released relationships (there are additional):

# Major Milestones

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